

What is claimed is:

1. A power generation process comprising the steps of:

(a) operating a turbine in a first mode wherein the turbine is powered by
combusting a first gaseous fuel comprising at least about 50 mole percent
methane in a burner; and

(b) operating the turbine in a second mode wherein the turbine is powered by
combusting a second gaseous fuel in the burner,

said second gaseous fuel comprising about 5 to about 90 mole percent of a light
hydrocarbon and about 10 to about 95 mole percent steam,

said light hydrocarbon comprising at least about 80 mole percent C₂-C₇ hydrocarbons.

2. The power generation process according to claim 1,

said first gaseous fuel being natural gas,

said light hydrocarbon comprising at least about 90 mole percent C₃-C₆
hydrocarbons,

said second gaseous fuel comprising about 10 to about 70 mole percent of the light
hydrocarbon and about 30 to about 90 mole percent steam.

3. The power generation process according to claim 1,

said second gaseous fuel having a Modified Wobbe Index within about 20 percent of
the first gaseous fuel at inlet conditions of the burner,

said second gaseous fuel having an adiabatic flame temperature within about 20
percent of the first gaseous fuel at operating conditions of the burner.

4. The power generation process according to claim 1,

step (b) including mixing the light hydrocarbon and steam in a fuel mixing device to
thereby form the second gaseous fuel and conducting the second gaseous fuel
from the fuel mixing device to the burner.

5. The power generation process according to claim 4,

step (b) including maintaining the second gaseous fuel above the dew point
temperature of the second gaseous fuel between the fuel mixing device and
the burner.

6. The power generation process according to claim 5,
step (b) including maintaining the second gaseous fuel below the critical point of the
second gaseous fuel between the fuel mixing device and the burner.

5 7. The power generation process according to claim 1; and
(c) switching between the first and second modes.

8. The power generation process according to claim 1; and
(d) operating the gas turbine in a third mode wherein the turbine is powered by
10 combusting a mixture of the first gaseous fuel and the second gaseous fuel in
the burner.

9. The power generation process according to claim 1,
said first gaseous fuel being fuel gas obtained from an LNG plant,
15 said second gaseous fuel comprising a mixture of natural gas liquids from an LNG
plant and steam.

10. A process for generating power using a gas turbine, said process comprising the steps of:

(a) combusting natural gas in a burner of the gas turbine; and

(b) combusting a steam-mixed fuel in the burner of the gas turbine, said steam-mixed fuel consisting essentially of a light hydrocarbon and steam, said steam-mixed fuel comprising about 10 to about 70 mole percent of the light hydrocarbon and about 30 to about 90 mole percent steam, said light hydrocarbon comprising at least about 90 mole percent C₂-C₇ hydrocarbons, said steam-mixed fuel having a Modified Wobbe Index within about 20 percent of the natural gas at inlet conditions of the burner, said steam-mixed fuel having an adiabatic flame temperature within about 20 percent of the natural gas at operating conditions of the burner.

11. The process according to claim 10,

said light hydrocarbon consisting essentially of a hydrocarbon selected from the group consisting of n-butane, n-pentane, and mixtures thereof.

12. The process according to claim 10; and

(c) switching between steps (a) and (b).

13. The process according to claim 10,

steps (a) and (b) being mutually exclusive.

14. The process according to claim 10; and

(d) performing steps (a) and (b) simultaneously by combusting a mixture of the natural gas and the steam-mixed fuel in the burner.

15. In a process for liquefying natural gas, the improvement comprises the steps of:

- 5 (a) combusting a gaseous steam-mixed fuel in a burner of a gas turbine used to power a fluid compressor, said steam-mixed fuel comprising about 5 to about 90 mole percent natural gas liquids and about 10 to about 95 mole percent steam, said natural gas liquids comprising at least about 80 mole percent C₂-C₇ hydrocarbons; and
- (b) combusting a gaseous fuel gas in the burner of the gas turbine, said fuel gas comprising at least 75 mole percent natural gas.

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16. The process according to claim 15, said steam-mixed fuel having a Modified Wobbe Index within about 20 percent of the fuel gas at inlet conditions of the burner, said steam-mixed fuel having an adiabatic flame temperature within about 20 percent of the fuel gas at operating conditions of the burner.

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17. The process according to claim 15, steps (a) and (b) being mutually exclusive.

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18. The process according to claim 15; and (c) combusting a mixture of the steam-mixed fuel and the fuel gas in the burner.